

Business for Social Responsibility

Beyond Neutrality: Moving Your Company Toward Climate Leadership

October 2007

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About This Report

This trends report describes how companies can create business and social value by acting on climate change beyond reducing their internal carbon emissions. It builds on a number of sources, including published company information and other literature, interviews with corporate practitioners and insights from BSR conferences, including the company roundtable “Arriving at Strategic Policy Positions on Climate Change” held in May 2007 in conjunction with Yale University and Time Warner.

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About Business for Social Responsibility

Since 1992, Business for Social Responsibility (BSR) has been providing socially responsible business solutions to many of the world’s leading corporations. Headquartered in San Francisco and with offices in Europe, China and Hong Kong, BSR is a nonprofit business association that serves its 250 member companies and other Global 1000 enterprises. Through advisory services, seminars and research, BSR works with corporations and concerned stakeholders of all types to create a more just and sustainable global economy. As a non-profit organization, BSR is uniquely positioned to promote cross-sector collaboration in ways that contribute to the advancement of corporate social responsibility and business success. For more information, visit www.bsr.org.

Note:

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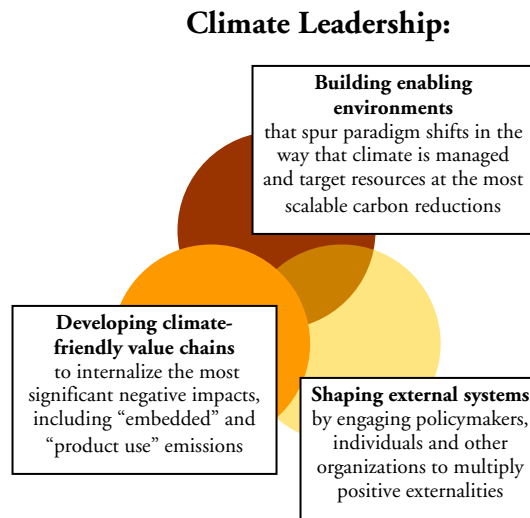
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1. Executive Summary

The certainty of climate change, and the attendant need for both mitigation and adaptation, has led most forward-looking companies to begin actively managing their carbon footprint, in some cases aiming to “neutralize” their footprint altogether.¹ Our research suggests that reducing and neutralizing one’s carbon footprint will soon evolve from “best practice” to industry standard.

As it does, it will become understood that most current emissions reduction metrics, while important, portray a limited view of a company’s impact on climate change. This is because most greenhouse gas (GHG) accounting tools create a “carbon management” frame that does not adequately address: 1) evidence that companies are maximizing potential **performance over time**; 2) the use of influence to improve **significant indirect impacts**; and 3) the contribution of capabilities and relationships for **entrepreneurial problem-solving**.

In this report, we examine an emerging pattern of practices that goes beyond – yet complements – carbon footprint management to facilitate climate change solutions while creating business value. We describe the current state of climate leadership in the following three interrelated areas of practices:



This trends report describes the following five major trends that together provide a rationale for companies to consider moving toward such leadership:

- 1) Climate change provides a new high-profile social platform on which to compete
- 2) Legal expectations for climate governance are broadening
- 3) Investors are looking for climate innovators
- 4) Customers are gradually beginning to take notice
- 5) Climatic realities will require more than individual corporate action

The report then outlines the benefits of nine approaches along with 27 illustrative practices that companies are increasingly acting on – and being measured against.

Area	Approach	Practices
Initiating Management Paradigm Shifts Building enabling environments that spur paradigm shifts in the way that climate is managed and target resources at the most scalable carbon reductions	Rethinking Basic Assumptions About Business Processes	i) Harnessing New Processes ii) Using Clean Energy and Fuel iii) Generating Clean Power
	Building Strong Governance Structures	i) Communicating Transparently ii) Ensuring High-Level Oversight of Climate Change Issues iii) Aligning the Organization
	Engaging Employees as Contributors	i) Institutionalizing a Culture of Conservation and Innovation ii) Integrating Problem Solving iii) Providing Consistent Incentives
Developing Climate-Friendly Value Chains Developing climate-friendly value chains to internalize the most significant negative impacts, including “embedded” and “product use” emissions	Reducing Embedded Emissions	i) Undertaking Due Diligence on Materials Specifications ii) Giving Preference to Low-Emissions Suppliers iii) Reducing Product Miles
	Designing Low-Emissions Products and Services	i) Designing Low-Emissions Products and Services ii) Linking Existing Products to Restoration iii) Deploying New Products
	Educating Customers	i) Labeling Products Better ii) Offering Product Metering to Provide Real-Time Energy Use Feedback iii) Providing Buyer and User Guidance
Shaping External Systems Shaping external systems by engaging policymakers, individuals and other organizations to multiply positive externalities	Advancing Dialogue on Policy	i) Stating Publicly the Company’s Support for Collaborative Solutions ii) Furthering Science-Based, Equity-Oriented Policy Frameworks iii) Building Global Pathways
	Co-Creating Opportunities with Other Organizations	i) Advancing Market-Based Initiatives ii) Building Informational Networks iii) Developing Operational Partnerships
	Encouraging Climate-Friendly Behavior among Individuals	i) Facilitating Dialogue ii) Enabling Action iii) Inspiring Lower-Impact Behaviors

11. Introduction

The projected impacts of climate change, and the increasingly urgent need for both mitigation and adaptation, have led many companies to begin actively managing their carbon footprints, with some aiming to “neutralize” their footprints completely.²

This practice of reducing direct emissions is usually achieved through energy efficiency measures – the cheapest and often fastest approach³ – and is frequently accompanied by purchases of renewable energy and/or offsets (described in BSR’s report “[A Three-Pronged Approach to Corporate Climate Strategy](#)”).⁴ Pioneer companies such as DuPont, Alcan, British Telecom, IBM and Norske Canada, each of which has reduced emissions by 60 percent since 1990, demonstrate the considerable potential for eliminating or reducing energy waste out from corporate facilities and processes.⁵ Given the associated cost savings, risk mitigation benefits and standardization of the practice, we predict that this approach will continue to provide benefits to most companies in the foreseeable future.

However, reducing or neutralizing one’s carbon footprint will soon evolve from “best practice” to industry standard. As it does, it will become clear that most current emissions reduction metrics, while important, portray a limited view of the company’s impact on climate change. This is because most greenhouse gas (GHG) accounting tools create a “carbon management” frame that does little to address: 1) evidence that companies are maximizing potential performance over time; 2) the use of influence to improve significant indirect impacts; and 3) the contribution of capabilities and relationships for entrepreneurial problem-solving.

Therefore, we have undertaken an examination of an emerging set of business practices that addresses these shortcomings and provides models for developing strategic, integrated approaches. These include:

- **Building enabling environments** that spur paradigm shifts in the way that climate is managed and target resources at the most scalable carbon reductions
- **Developing climate-friendly value chains** to internalize the most significant negative impacts, including “embedded” and “product use” emissions
- **Shaping external systems** by engaging policymakers, individuals and other organizations to multiply positive externalities

In doing so, companies may complement their carbon *management* – the tactical, quantifiable, internally-facing practice of reducing internal emissions – with *leadership* initiatives that are strategic, systems-oriented approaches often best explained qualitatively.

The following section details the five main reasons it makes sense for companies to consider moving toward the leadership practices we describe in this report.

1: A new and high-profile social platform on which to compete

Earlier this year, *The New York Times* described the emergence of a new hybrid “fourth sector,” made up of for-profit companies with social missions.⁶ The *Stanford Social Innovation Review* described this development in a slightly different way, claiming that the business and nonprofit sectors are converging.⁷ Each point to a similar trend: *creating social value through business is becoming an attractive way to compete.*

Given that climate change represents one of the most challenging social problems of this century, there are a growing number of ways companies can use leadership on the issue to create business value. Some companies are focusing attention upstream by working with suppliers, while others focus downstream on the climate action potential of their customers. Still others work horizontally, through leadership in trade associations, industry consortia or through lobbyists. With such a high-profile issue as climate change, innovation comes with free publicity (see CNBC’s Top 50 Low-Carbon Pioneers,⁸ *BusinessWeek*’s Top Climate Companies of the Decade,⁹ and *Fortune*’s 10 Green Giants¹⁰).

2: Legal expectations for climate governance are broadening

In many legal contexts, corporate board members are protected from liability if they have acted on an informed basis and in good faith.¹¹ Increasingly, the company’s climate impacts, as well as climate change impacts on shareholder value, are considered material information for decision making at the Board level. Insurer Swiss Re has begun factoring executive handling of climate change into insurance premiums and providing corporate boards with training on their evolving responsibilities with respect to climate issues.¹² Yet to date, only 14 percent of S&P500 companies have a standing Board committee on public policy or CSR, let alone climate change.¹³ While the legal expectations for climate governance broaden, legal frameworks for how to structure this governance remain undefined, effectively placing the onus on individual companies.

3: Investors are looking for climate innovators

Investors, assisted by globalizing markets and expanding information networks, are looking beyond companies that simply reduce emissions to those that demonstrate qualitatively that they are managing climate change in an innovative and comprehensive manner. As the niche [Dow Jones Sustainability Index](#) and [FTSE4Good](#) indices develop more descriptive performance criteria, a growing number of investors are demanding that mainstream asset managers are accountable for factoring in climate considerations. These include the Carbon Disclosure Project (representing US\$41 trillion in assets), the UN Principles for Responsible Investment initiative (representing US\$10 trillion) and the Investor Network on Climate Risk (representing US\$3 trillion). More recently, tools like the envIMPACT(R) are allowing investors to track stocks based on the carbon risk associated with a company’s business inputs, partners and products.¹⁴

4: Customers are gradually beginning to take notice

Customer preferences, although ever-complex to track, are starting to converge with respect to climate change on at least two points: there is greater demand for more climate-friendly products, along with a growing demand for help in making informed choices.¹⁵ As a result, third-party scorecards and rankings like [Climate Counts](#) and [Consumer Reports’ Greener](#)

[Choices](#) are starting to emerge, while numerous online searchable resources make informed shopping far easier (e.g. [Yahoo! Autos](#), [iGoGreen](#), [www.greenopia.com](#), [www.idealbite.com](#), [www.thedailygreen.com](#), [www.lime.com](#), [www.gliving.tv](#), and [Topten.info](#)).

5: Climate realities will require more than individual corporate action

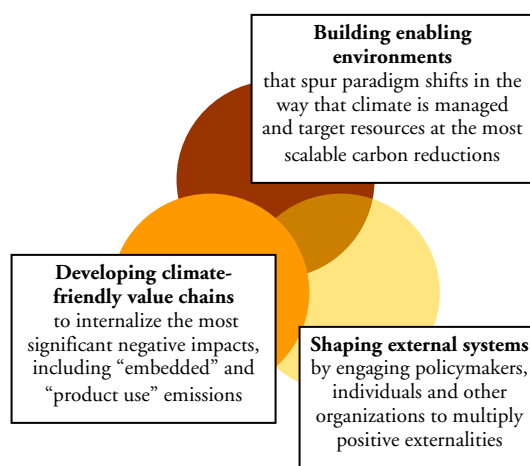
Scientific consensus suggests that, while we are locked into a certain level of climate change given climatic momentum, society can avoid “dangerous levels of climate change” through the deployment of existing technologies and widespread behavior change.¹⁶ Considering that emissions result from billions of independent actors¹⁷ across thousands of regulatory environments, calling on individual companies to become “carbon neutral” while waiting for new technologies to fix climate change will not suffice. Instead, it will become essential to recognize that companies are inextricably linked to thousands of suppliers and millions of customers over whom they have significant influence, and it is there that we will find the root causes of industrial emissions, as well as the greatest potential for innovative solutions.

Pieced together, these five developments demonstrate an increasingly clear demand for companies to develop collaborative, solutions-oriented leadership practices to complement existing internally-based approaches to carbon management. Moreover, these trends evidence the need for quantitative emissions tracking to be accompanied by more nuanced qualitative indicators, including progress with processes as well as end results. Given that climate leadership is uncharted territory, this will require more effort on the part of the company itself, but also more effort and education on the part of the investment analysts, shareholders, regulators and customers who track corporate performance.

Initiating, Internalizing and Influencing

Corporate leadership will be linked to climate change in three areas: Building enabling environments, developing climate-friendly value chains and shaping external systems.

Climate Leadership



By **building enabling environments**, companies spur paradigm shifts in the way that climate is managed and target resources at the most scalable carbon reductions. Such efforts tend to complement the management of internal emissions, for which incremental quantitative results are emphasized, along with the development of systems that support reductions over longer periods of time and are often explained best as processes and in qualitative terms. In changing paradigms, companies go beyond making a one-time emissions decrease – or buying them as offsets – and build the capacity and likelihood to generate more reductions in scale.

In **developing climate-friendly value chains**, businesses are internalizing indirect – though often significant – impacts, including “embedded” and “product use” emissions. These initiatives extend beyond that of managing emissions from sources that the company controls to those within its broader sphere of influence. Leaders are recognizing that this is important because, although direct emissions are relatively straightforward to track, simply targeting end-of-pipe solutions just moves “pollution around in a circle.”¹⁸ Focusing narrowly on one company’s internal emissions can also be misleading. For example, the production of aluminum is relatively emissions-intensive, creating 12 tons of emissions for every 1 ton of finished product. Yet that same ton of aluminum added to a car can save 20 tons of emissions over the car’s lifecycle.¹⁹

When **shaping external systems**, firms are engaging policymakers, individuals and other organizations to multiply positive effects. Contrary to traditional environmental management that seeks to contain and *internalize* negative impacts, those shaping external systems recognize opportunities to create value by using their capabilities and relationships to creatively *externalize*

positive impacts. In so doing, an individual company can multiply its climate benefits significantly.

In the next three sections, we detail the three main classes of climate change leadership that goes “Beyond Neutrality”:

- A. Building enabling environments
- B. Developing Climate-Friendly Value Chains
- C. Shaping External Systems

III. Initiating Management Paradigm Shifts

Rather than trying to clean up at the end of the pipe ... how do I fundamentally change the process?

- Chad Holliday, CEO, DuPont, 2007²⁰

In addition to generating near-term incremental emissions reductions, **companies need to build enabling environments** that spur paradigm shifts in the way that climate is managed and target resources at the most scalable carbon reduction opportunities. Consider the example of DuPont, a \$27 billion chemical company with operations in 75 countries. The company is well regarded for achieving substantial emissions reductions over the past 15 years, as well as making further commitments to reach 65 percent below 1990 emissions levels by 2010.²¹ The company considers internal capacity building important for co-generating social benefit, business opportunity and growth in the context of climate change.

DuPont is **rethinking basic assumptions about business processes**. For example, it is leading an effort to build the world's first pilot project "bio-refinery," using the plant to produce ethanol from corn. In addition, the company is actively developing next-generation refrigeration systems, fuel cells, biomaterials, lightweighting materials and energy-saving insulation.²² At the same time, DuPont is switching its existing energy and fuel sources to solar, wind, geothermal, biogas, biomass and low-impact hydro, and has been recognized by the U.S. EPA as the 7th largest clean energy purchaser.²³

DuPont has been **building strong governance structures** since 1994, when it published its first Environmental Policy. The company ensures high-level oversight over climate issues through a board-level Environmental Policy Committee, chaired by former EPA Administrator Bill Reilly, which is kept apprised of developments and periodically reviews company policies for organizational alignment and consistency. In addition, CEO Chad Holliday chairs a cross-organizational Sustainable Growth Council, while two company vice presidents co-chair an Executive Climate Change Steering Committee.²⁴ This cross-organizational coordination, combined with the Board-level oversight, have enabled DuPont to lead the way in transparency on climate risks, not only through its annual sustainability report but in public filings to the U.S. Securities and Exchange Commission. Finally, the company supports organizational alignment with its Asset Productivity Leadership Team, an internal group positioned to manage high-ROI projects with energy-saving responsibilities.²⁵

Lastly, DuPont is **enabling employees as contributors**. It has developed a corporate culture of environmental stewardship that evolved from a focus on safety with symbolic stretch goals including "zero injuries, illnesses, incidents, wastes and emissions."²⁶ The company integrates problem solving throughout, building a framework for sustainability issues on the basis of its pioneering work in assessing, designing and operationalizing safety risk management²⁷. DuPont also provides ongoing incentives through its Variable Compensation Plan,²⁸ which rewards employee performance in environmental stewardship.

The DuPont case demonstrates the effectiveness of three basic approaches to initiating management paradigm shifts:

A. Rethinking Basic Assumptions About Business Processes

B. Building Strong Governance Structures

C. Engaging Employees as Contributors

A. Rethinking Basic Assumptions About Business Processes

Today's business environment requires companies to rethink their most basic assumptions about i) how products are made, ii) what energy to use, and iii) what opportunities exist for creating net energy-*positive* processes. In the course of making long-term commitments to leverage new systems and technologies, companies are able to focus on long-term shareholder value and may even see transformational changes in their business models, as evidenced in the following examples.

i) Harnessing New Processes

including technologies for greater scale efficiencies, decarbonization and carbon capture and storage

- [Nike](#), after some years and many millions of dollars in investments, removed SF6 – a large, tightly bound molecule and one of the most harmful greenhouse gases – from the process it uses to fill air pockets in its shoes.²⁹
- [Unilever](#) has switched its freezer technologies from HFCs, one of the most potent greenhouse gases, to natural gas.³⁰
- [Cisco](#) is investing \$20 million in technology to reduce company travel, through which it expects to reduce carbon emissions by 10 percent.³¹
- [FedEx](#) began using the first commercially-available hybrid trucks in 2005.
- [Abbot](#) has created new systems to improve vehicle efficiency and reduce fuel use, aiming to reduce emissions to 10 percent below 2004 levels by 2010.³²
- [HP](#), in developing a Telework program enabling employees to work from home, has reduced emissions associated with over 2 million roundtrips.³³
- [Vodafone](#) is working with suppliers to design better network cooling systems.³⁴
- [Rio Tinto](#) is developing “low emissions pathways” to reduce emissions intensity in coal combustion, metals smelting and electricity use.³⁵
- [Xcel Energy](#) is building an integrated gasification combined cycle (IGCC) plant in Colorado, the first U.S. coal plant to reduce emissions through the capture and underground storage of greenhouse gases.³⁶

ii) Using Clean Energy and Fuel

including switching to renewable energy and biofuels

- [PepsiCo](#) is purchasing RECs to match 100 percent of its electricity purchased in the United States, becoming the largest clean energy buyer in the country.³⁷
- [Xcel Energy](#) has acquired 775 megawatts of new wind power in Colorado, making it one of the nation's largest utility purchasers of wind energy.
- [Marks and Spencer](#), which has recently launched the £200m sustainability initiative "Plan A," fuels its trucks with a minimum of 50 percent biodiesel.³⁸
- [Safeway](#) has switched 17 of 42 trucks in one of its UK hubs to compressed natural gas.³⁹
- [Johnson and Johnson](#), which considers itself not a huge energy user but still a sizable company with a high profile, has partnered with Green Power Group to pool green energy demand for RECs.
- [News Corporation](#), as part of its Cool Change initiative, has begun switching its fleet cars to hybrid vehicles at its News Digital Media Australian subsidiary, and generating electricity with biodiesel on the set of "24."⁴⁰

iii) Generating Clean Power

including from solar, wind, biomass, landfill gas, geothermal and sustainable hydro power

- [Google](#) is building a 1.6-megawatt solar photovoltaic panel array, the largest corporate campus solar energy project in the United States.⁴¹
- [Staples](#) is investing heavily in solar power. Its 2006 investments helped reduce 19 percent of its total U.S. GHG emissions from 2001 to 2006.⁴²
- [Johnson Controls](#) is investing \$45 million to add green roofs, wind turbines, solar panels and a geothermal field to its international headquarters.⁴³
- [BP](#) is investing \$8 billion in solar, wind, hydrogen and combined-cycle power generation over the next 10 years.⁴⁴
- [Akeena Solar](#), a renewable energy provider, generates all of its own energy at a cost savings over traditional energy.⁴⁵
- [Tyson Foods](#), the world's largest chicken producer, has developed Tyson Renewable Energy to turn its annual 2.3 billion pounds of animal fat byproducts into biofuels.⁴⁶
- [Lafarge Cement UK](#) saved over 100,000 tons of CO₂ in three years by in part using pulverized fuel ash to displace limestone and using waste tires for fuel.⁴⁷

Summarizing the Benefits

Rethinking basic assumptions means that companies will face a number of expenditures, both in terms of cash outlays and risks. At the same time there are often significant opportunities for quick wins, high NPV project gains and a host of intangible benefits, including:

- + **Scaling up future emissions reductions** by encouraging coordination and idea generation from all levels of the company
- + **Getting a step ahead** on technological advances that could become industry standard
- + **Differentiating among prospective employees** as a company that is thoughtful and innovative on emergent trends
- + **Gaining publicity** for making technological advances

B. Building Strong Governance Structures

Whether you're a hedge fund manager, regulator or journalist, one of the hottest topics in today's market is governance. While the subject is complex, there is one clear trend with regard to climate change: increased scrutiny by stakeholders to ensure that companies act with due diligence. Heavily regulated industries, such as chemicals and power generation, have long had Board oversight over climate issues. But industries outside the regulatory umbrella, such as agriculture and retail goods, also benefit from building strong governance mechanisms that i) communicate issues of concern to stakeholders and the public, ii) ensure high-level oversight, and iii) align the organization with evolving goals.

i) Communicating Transparently

including disclosing key issues, impacts, risks and plans associated with climate change

- [AEP](#), an electric utility, publishes targets to reduce GHGs and information on its IGCC investments.
- [Dow Chemical Company](#) discusses key issues, impacts and leadership initiatives related to climate change on its website, discloses climate change uncertainties in its securities filings, and produces an annual sustainability report as well as a Global Reporting Initiative (GRI), which details GHG emissions metrics.⁴⁸
- [Alcan](#), an aluminum producer, publishes emissions reductions annually and aims to help the entire industry become carbon neutral by 2020.
- [Ford Motor Company](#) recently commissioned the report, "The Business Impact of Climate Change," which outlines the company's forecasted challenges as a result of expected climate change effects.⁴⁹
- [Rohm and Haas Co.](#) explains in its security filings that climate change presents certain political risks and states publicly that, although limiting emissions might restrict business growth, there is nevertheless cause for the company to take action.⁵⁰

ii) Ensuring High-Level Oversight of Climate Change Issues

including responsibility and coordination among and between boards and senior management, and assuring that directors are fully informed of material climate risks as per the judgment rule

- [HP](#)'s Executive Council directly oversees a Supply Chain Board, which all company businesses support with a Procurement Management Process defining supply chain social and environmental responsibility (SER) buying criteria.
- [Bayer](#) has an executive Corporate Sustainability Board on climate change and a working group on renewable raw materials.⁵¹

- [AEP](#) has its Board overseeing production of reports on climate risk mitigation strategies. The Chief Environmental Officer reports directly to the CEO.
- [International Paper](#)'s Board Public Policy & Environmental Committee oversees senior executive climate policy group and another senior executive group reviews all climate policies.
- [Rio Tinto](#) has a Climate Change Leadership Panel and Executive Coordinator.

iii) Aligning the Organization

by enhancing inter-departmental communication and reconciling competing objectives; developing shared understanding of relationships between short and long term and direct and indirect issues; and creating consistent messaging internally and externally, including related to lobbying

- [BP](#), having realized that production performance and environmental performance are not independent, actively manages the multivariate and often competing objectives of increasing volume, producing cleaner fuels and reducing greenhouse gases.⁵²
- [GE](#) has a company-wide campaign to create expectations for individual business lines to set reduction targets.
- [Johnson and Johnson](#) uses an “Environmental Dashboard,” for which carbon emissions are one metric that each employee’s performance is assessed on.

Summarizing the Benefits

Of course, when it comes to governance structures, there is no one-size-fits-all approach. For some companies, climate change may not be sufficiently material to the company to merit Board-level oversight. However, robust governance is important for virtually every company to ensure integrity in the stewardship of investors’ and other stakeholders’ interests. Explicit benefits include:

- | | |
|---|---|
| + Building goodwill with oversight agencies
by being among the first to disclose material climate risks | + Gaining improved standing with investors
who wish to see careful governance and oversight |
| + Tracking and anticipating policy developments in an uncertain yet fast-moving regulatory context | + Avoiding risks from misalignment such as negative scrutiny when climate commitments and lobbying contradict each other |

C. Engaging Employees as Contributors

Not all emergent issues are salient enough to require full engagement of a company's employee base. Climate change, however, has become front-and-center in everyday conversation. It is a challenge so immense in magnitude and global in scope that it threatens to overwhelm individual concerns. Companies are in a unique position to empower individual employees and make them feel as though, through their everyday work or simply their choice of employers, they are contributing to a solution. Moreover, employee involvement is essential to the success of any new environmental initiative.

i) Institutionalizing a Culture of Conservation and Innovation while involving employees more with climate change outcomes

- [Serco Leisure](#) taps employee creativity through a “Big Ideas” staff suggestion scheme, competitions between sites, and e-mails, workshops, staff meetings and notice board communications to encourage efficient energy use.⁵³
- [DLA Piper](#) is challenging its employees to make small, but collectively significant, behavior changes, such as turning off lights, using double-sided printing and video conferencing.⁵⁴
- [Wal-Mart](#) is using “Personal Sustainability Projects” to educate staff and drive cultural change towards sustainability with the help of Act Now.
- [prAna](#) buys renewable energy credits to offset employees' home electricity use.⁵⁵
- [Prospero Recruitment Ltd.](#) has reduced waste by 90 percent through simple practices such as powering down IT hardware when not in use, switching to energy efficient light bulbs, slightly turning down heat and recycling waste.⁵⁶
- [Agilent Technologies](#) encourages energy saving with a campaign teaching practical tips that have helped reduce energy use for five years in a row.⁵⁷
- [Google](#) uses discussion forums and e-mailings to facilitate employee carpooling.⁵⁸
- [Sun Microsystems](#) developed an Eco-Responsibility Initiative that allows over 40 percent of employees to regularly work outside of the company's offices. It saved \$50 million and realized a significant carbon footprint reduction in 2005.⁵⁹
- [3M](#) has a “15 Percent Rule” that allows engineers to spend 15 percent of their time on projects of their own choice.⁶⁰

ii) Integrating Problem Solving

by broadening from managing “silos” to managing the entire organization

- [Rio Tinto](#) has climate goals and regional workshops for each business unit.
- [Herman Miller](#) uses an Environmental Quality Action Team (EQAT), a matrix of nine subcommittees, to engage all employees in environmental stewardship.⁶¹
- [3M](#) uses a company-wide system called Pollution Prevention Pays (3P) that encourages employees at all levels to rethink products and processes to eliminate waste. Over the past three decades, the program has generated gains every year.⁶²
- [Shell](#) has developed an internal “Energise” program that brings specialized teams to chemicals locations to carry out advanced energy modeling and benchmarking that help identify areas where improvements can be made.⁶³
- [Toyota](#) has a Global Warming Prevention Council, which was formed in 1998;⁶⁴ the company uses computerized forecasts of energy loads and green building.
- [Alcoa](#), which has developed a “Greenhouse Gas Network” initiative, has launched an internal GHG information system that tracks emissions data for its worldwide operations since 1998.⁶⁵
- [Cadbury](#), which recently announced a plan to cut emissions by 50 percent, intends to encourage “green activism” among employees by giving them more authority to develop a “culture of environmental consciousness.”⁶⁶

iii) Providing Consistent Incentives

including developing and staffing roles and performance measures conducive to paradigm shifts

- [Camelot Group plc](#) has developed a team that motivates and rewards employees who demonstrate leadership in conservation.⁶⁷
- [Timberland](#) provides \$3,000 to employees to subsidize fuel-efficient hybrid cars.⁶⁸
- [Alza](#) pays employees \$1/day when they bike, walk or carpool to work.⁶⁹
- [Hyperion](#), as part of its “Drive Clean to Drive Change” employee program, offers \$5,000 to 200 employees per year for the purchase of cars that average 45 MPG or better.⁷⁰

Summarizing the Benefits

As with all business transitions, it is crucial to engage employees proactively in the co-creation of solutions. But in so doing, it is equally important to design outreach strategies that fit the individual company's culture. With climate change, some companies have been very successful in espousing a "business case" approach with employees, while others gain more traction through emotional appeals. In certain cultures, setting ambitious targets works to motivate staff and generate new ideas, while in others a conservative and deliberate approach is more appropriate. Regardless of the actual tactics used, companies can often expect the following benefits:

+ **Multiplying your impacts by inspiring employees** to model the company's climate commitments in their personal lives

+ **Gathering new ideas from line managers** who have intimate knowledge of potential improvements

+ **Keeping employees engaged** in their work and assured by the company's ever-evolving approach

+ **Inspiring product designers** to think more creatively about materials and new market niches

IV. Developing Climate-Friendly Value Chains

Ninety percent of the impact ... is in the supply chain

- H. Lee Scott, CEO, Wal-Mart, 2006⁷¹

Beyond making reductions to the emissions “inventory” as defined by the scope of control or ownership, we advise companies to pay more attention to **developing climate-friendly value chains in order to internalize the most significant negative impacts** associated with their business, including “embedded” and “usage” emissions throughout the organization. For example, Wal-Mart, a \$348 billion international retailer, has recently undertaken efforts to lower emissions in its 6,700 store facilities and offices.⁷² But no matter how low it can reduce its direct emissions, Wal-Mart acknowledges that its approximately 68,000 suppliers, immense distribution network and wide customer base is in turn a system responsible for enormous emissions – and one that the company is in a position to influence. As a result, it has recently launched “Sustainability 360,” designed to assess root causes and collaborate with up- and down-stream partners to reduce embedded emissions, design low-impact products and to educate its buyers.⁷³

Wal-Mart is **reducing embedded emissions** by asking some of its suppliers to provide data on the energy efficiency, packaging, recycling and hazardous substances in the goods it buys. The company then scores its suppliers based upon these criteria, calls on them to prioritize certain “preferred materials,” and encourages them to share sustainability information between themselves.⁷⁴ Wal-Mart is also addressing embedded emissions in the transport of its products by retrofitting its fleet with trailer side skirts, super single tires, aerodynamic tractor packages, lighter axles, and auxiliary power units.⁷⁵

The company is collaborating to **design low-emissions products and services** in order to take non-renewable energy “off [the] shelves and out of the lives” of customers.⁷⁶ Wal-Mart has started to promote the benefits of products with lower carbon footprints such as Unilever’s All Small & Mighty detergent⁷⁷ and the Impact GC3502 Earth Friendly PC.⁷⁸ Together with General Electric, which controls 60 percent of the U.S. market for residential light bulbs, Wal-Mart plans to sell 100 million compact fluorescent bulbs by the end of 2007 – one for every household in the United States.⁷⁹ The company is shrinking overall packaging by 5 percent by 2013, for which it expects to save \$3.5 million for itself and \$7 billion for its suppliers, noting that “Even small changes to packaging have a significant ripple effect.”⁸⁰

Finally, Wal-Mart realizes that with 176 million customers shopping in 14 countries weekly,⁸¹ including nearly 90 percent of American households,⁸² it has the opportunity to **educate customers on product attributes and low-impact usage options** on a massive scale. The company is developing a “Live Better Index” to gauge its customers’ shopping habits, preferences and attitudes associated with sustainability. Meanwhile, a key agenda for companies like Wal-Mart will be to show customers that “green” products can be affordable and accessible.⁸³ Although the company’s efforts in this area are nascent, it is clear that it will find significant opportunity to create climate-friendly value chains by labeling products better, offering product metering, and providing buyers and users with guidance.

The Wal-Mart example demonstrates the following three approaches to developing climate-friendly supply chains:

A. Reducing Embedded Emissions

B. Designing Low-Emissions Products and Services

C. Reducing Product Miles

A. Reducing Embedded Emissions

In general, supply chains are globalizing, suppliers are consolidating, and company supply functions bear more responsibility for revenue and innovation.⁸⁴ In this context, many companies are beginning to reap supply chain benefits by reducing “embedded” emissions – those that have already occurred upstream – through clear procurement criteria and logistics rationalization. Companies who make it clear that they want to minimize embedded emissions can influence suppliers to become part of a climate-friendly value chain.

i) Undertaking Due Diligence on Materials Specifications

including “preferred substances” lists for suppliers and developing shared vision and incentives

- [Walkers](#) recently found that by purchasing potatoes by low water content, rather than by weight, suppliers reduced their energy inputs, transportation become more fuel efficient, and there were fewer costs associated with post-purchase drying.⁸⁵
- [IKEA](#), as part of its IWAY program, uses an evaluation checklist to appraise sustainability impacts of its materials, including emissions of its forestry inputs, rating with a four-tiered “staircase” scoring system.⁸⁶
- [Herman Miller](#) chooses material inputs based on emissions and other sustainability impacts as part of its “Perfect Vision” and Design for Environment (DfE) objectives of no landfill, hazardous waste, or air/water emissions by 2020.
- [Random House](#) is increasing recycled fiber tenfold by 2010, from 3 percent to 30 percent of paper volume.⁸⁷
- [Nike](#) is working with the Fair Labor Association to design sustainable elements into its product engineering, commercialization processes and end-use recycling potential.

ii) Giving Preference to Low-Emissions Suppliers

including ranking suppliers on climate performance and working to help existing suppliers improve

- [Unilever](#), which finds that raw materials account for up to 10 times the company's internal emissions, gives preference to suppliers with lower emissions.⁸⁸
- [Starbucks](#) assesses costs and benefits from a systems perspective, giving preference to suppliers using lower emissions. Starbucks is also piloting a project that teaches suppliers to identify root causes of issues in order to develop sustainable solutions themselves.
- [Novo Nordisk](#), as part of its Sustainable Supply Chain Management program, requires suppliers to complete a self-evaluation questionnaire as part of their contracts.
- [Vodafone](#) is working with suppliers to develop more energy-efficient network equipment.
- [Nike](#), while saying that emissions from contracted manufacturing and shipping operations are outside the “widely accepted boundaries” of its footprint,⁸⁹ acknowledges that they represent eight times the emissions of internal operations and business travel, and thus is working to factor in supplier emissions into its scoring system for partner selection.
- [BskyB](#), after hosting supplier workshops on environmental performance, has led 10 suppliers to follow their initiative to become carbon neutral.⁹⁰

iii) Reducing Product Miles

by optimizing routes, localizing sourcing and using more efficient distribution technologies

- [Timberland](#), along with several other companies including [Ikea](#) and [Maersk](#), are engaged in the BSR [Clean Cargo Working Group](#) to promote industry-wide tools and methodologies for shippers to collaborate with carriers in tracking and reducing carbon emissions.⁹¹
- [Marks & Spencer](#) is reducing food miles by doubling regional food sourcing in 12 months and working with growers to extend British growing seasons through new varieties and growing techniques as part of a three-year commitment.⁹²
- [UPS](#) is using the routing tool RoadNet to optimize and balance delivery profitability and customer service through routing efficiency.⁹³
- [Nike](#) has committed to reducing inbound logistics emissions 30 percent from the 2003 baseline by 2020.⁹⁴
- [Zara](#) has found that sourcing locally, which often creates much lower emissions, offers other important direct benefits such as speed and flexibility, particularly when a greater level of demand uncertainty or local information, manufacturing technology,

subcontractor clusters and/or opportunities for long-term subcontractor relationships are present.⁹⁵

- [Tesco](#) worked with local suppliers to grow green apples in England so that it has switched to sourcing locally.⁹⁶
- [Safeway](#) is reducing freight miles and increasing efficiency in part by using Logic information software to track vehicles and avoid congested areas.⁹⁷

Summarizing the Benefits

Companies that once sought to ruthlessly wring out supply chain costs now see that some expenditures associated with reducing emissions and other externalities – planning better, sourcing locally, upgrading transport modes and fuel, and collaborating with other industry players – can be seen as investments that afford a number of direct and indirect benefits. Such benefits may include:

+ **Improving relationships** with suppliers, who often stand to benefit from education on becoming greener

+ **Differentiating from peers by implementing supply chain emissions tracking**, which only 16 percent of FT500 companies have in place⁹⁸

+ **Reducing risk** from suppliers whose performance may slip as a result of increasing regulation, and from customers who are increasingly scrutinizing supply chain impacts

+ **Direct cost savings** from identifying opportunities for eliminating waste across organizations collaboratively

B. Designing Low-Emissions Products and Services

In theory, all industrial emissions can be assigned to their end customers.⁹⁹ While the processes used in the production of electricity, steel and chemicals are often considered to be high direct emissions sources, they – as well as all other industrial processes – result from a chain of customer demands.¹⁰⁰ At the same time, customers are generally not willing to be held solely accountable for these emissions, since they have little control over how products are made or how energy is obtained. And since over 80 percent of emission reductions are achievable at the design stage,¹⁰¹ it will be producers, not consumers, who are ultimately associated with the bulk of emissions.

In light of this dynamic, companies are increasingly tapping in-house R&D teams or collaborating with suppliers to move beyond “recycling, reusing and reducing” to “redesigning and re-imagining” how their products might be used, a field known as Design for Environment (DfE).¹⁰²

i) Reducing Lifecycle Emissions in Existing Products

including packaging reductions, low-usage emissions rates and end-of-life reverse logistics

- [General Electric](#) launched its “Ecomagination” project in 2005, an initiative undertaking investments in climate-friendly technologies expected to reach \$20 billion in annual sales by 2010. The company will also double its investments in clean technologies to \$1.5 billion a year by 2010, including wind turbines, high-efficiency gas turbines, IGCC power plants, and hybrid diesel-electric locomotives.¹⁰³
- [P&G](#) has doubled detergent concentrations in order to shrink packaging by 22 percent and reduce the energy needed for manufacturing, transportation and landfill waste.
- [HP](#) has redesigned print cartridge packaging to save 37 million pounds of emissions annually.¹⁰⁴
- [Toyota](#) is starting to offer Corolla subcompacts that run on ethanol and gasoline mixtures in Brazil.¹⁰⁵
- [Tesco](#) encourages customers to shop from home with its online grocery shopping service, which it estimates saves 100 million road miles each year.¹⁰⁶
- [Nau](#), the lifestyle outdoor clothing company, developed a “webfront” hybrid selling channel, which stocks low inventory and offers incentives to customers to have products shipped.
- [Unilever](#) has redesigned soaps and apparel for lower temperature washing.¹⁰⁷
- [Steelcase](#), considering that landfill methane is a chief GHG emissions driver, worked with McDonough Braungart Design Chemistry to make 99-percent recyclable chairs.¹⁰⁸

- [DuPont](#) is developing low-impact refrigerants and leading an effort to build the first “bio-refinery” using a whole corn plant to produce ethanol.¹⁰⁹

ii) Linking Existing Products to Restoration including complementary product offers and emissions offsets

- [BSkyB](#) provides customers automatic standby products for set-top boxes that have reduced emissions 32,000 tons.¹¹⁰
- [GE](#)’s Earth Rewards Credit Card and [Metabank](#)’s GreenPay MasterCard link purchases with offset projects. [BP](#)’s Global Choice program works similarly for business customers.
- [Barclay’s](#) offers the Barclaycard Breathe, from which 50 percent of profits are donated to climate change-related projects.¹¹¹
- [evo](#) allows customers to offset emissions from deliveries for about \$0.50 per order, which about 7.5 percent of its customers regularly take advantage of.¹¹²
- [New Resource Bank](#) offers financial incentives for green building projects, including 0.125 percent discount on loans to green leadership projects in commercial and multi-unit residential sectors.¹¹³
- [UPS](#) has packaged its capabilities with fleet efficiency to offer the Roadnet Transportation Suite consulting service, which streamlines routes, reducing 400,000 annual miles at client Associated Food Stores.¹¹⁴

iii) Deploying New Products such as new technologies and new value propositions for existing technologies

- [Liftshare.com](#) has developed a car share model that provides a national database for individuals and for-profit business model for organizational partners to save approximately 14 million car-miles and 5,800 MTCE reductions annually.¹¹⁵
- [General Electric](#), through its Ecomagination program, is developing new consumer and industrial products such as the Jenbacher Biogas engine, which converts organic waste, a source of greenhouse gas emissions, into energy.

Summarizing the Benefits

+ **Cornering growth markets in low-carbon products**, which are predicted to exceed \$500 billion per year by 2050¹¹⁶

+ **Enhancing reputation** among customers, particularly in industries with relatively high embedded emissions

+ **Gaining regulatory advantages**, including potentially gaining credit for reducing the embedded energy of products and preparedness for product regulation

+ **Diversifying into new complementary services**, which will often be higher-margin

C. Educating Customers

Despite the rising profile of climate change in public discourse, customers are confused about what they should do, are discouraged by inadequate product information¹¹⁷ and “green premiums,” and are skeptical of claims made by business.¹¹⁸ Until recently, customers have been given little objective and meaningful information upon which to base their purchasing decisions. But this is changing. A growing cadre of companies is educating their customers on the climate impacts of their consumer choices, providing metrics that they can use to better understand products, and offering more comprehensive reassurance.

i) Labeling Products Better

to advise on information about embedded and product use emissions

- [Timberland](#) is developing “Green Index” tags to communicate embedded emissions and other impacts to customers, starting with the Greenscapes line in 2007. It aims to carry the label on all shoes by 2010.¹¹⁹
- [Marks & Spencer](#), while proactively reducing the amount of air-freighted food, is including symbols depicting airplanes on food products that it does fly.¹²⁰
- [Tesco](#), like Marks & Spencer, also will label products with emissions information.¹²¹
- [Unilever](#) intends to incorporate its own “greenhouse gas index.”¹²²

ii) Offering Product Metering to Provide Real-Time Energy Use Feedback

such as user-friendly, web-accessible applications

- To continually improve efficiency in its products and data centers, [IBM](#) has announced a \$1 billion Big Green project, which will provide users with the ability to analyze existing systems to identify areas for improvement, along with management systems that allow customers advanced control over the energy use of their systems.¹²³
- [PG&E](#), in partnership with Wellington Energy, is providing smart meters to customers, which it promises that in the future customers will use to manage their energy usage via the Internet.¹²⁴
- [EDF Energy](#) is piloting a scheme providing free smart meters to customers on request.
- [Easyway Insurance Brokers](#) are providing customers optional smart meters to measure fuel efficiency for their cars.¹²⁵

iii) Providing Buyer and User Guidance for choosing products and optimizing usage efficiency

- [Shell](#), which acknowledges that over 80 percent of emissions from fossil fuels are emitted when energy products are used, has developed a Fuel Stretch Campaign to help customers understand how to make fuel go farther.¹²⁶
- [The Co-operative Group](#), along with introducing high-efficiency light bulbs and appliances, has discontinued inefficient products to reduce confusion and help customers make better choices more easily.¹²⁷
- [Swiss Re](#), in asking for information on climate change management practices and factoring results into premiums, educates its corporate clients and informs them of benefits for considering broad climate issues.¹²⁸
- [Royal Philips Electronics](#) has developed Asimpleswitch.com to educate consumers on simple actions that they can take to reduce energy use for products already purchased.
- [Unilever](#)'s Washright program encourages consumers to wash at lower temperatures and use full washes.¹²⁹

Summarizing the Benefits

Companies are learning that in order to successfully educate customers, they must also provide reassurance by offering consistent messages, using credible messengers, providing layers of information, exemplifying action and linking four things: responsibility, quality, service and value-for-money.¹³⁰ This creates an opportunity to improve value for customers, as well as other stakeholders. Such potential benefits include:

+ **Gaining more insights** from customers by better understanding their attitudes and preferences.

+ **Building the brand** as a company that integrates current and long-term social, environmental and financial considerations into planning

+ **Improving collaboration** with NGOs that have often criticized companies for causing negative impacts

+ **Innovation inspired** by using the company's resources to think differently and take on diverse challenges

V. Shaping External Systems

The time has come for constructive action that draws strength equally from business, government and non-governmental stakeholders.

- Jeffrey Immelt, CEO, General Electric, 2007¹³¹

While many early corporate climate change initiatives have focused on *internalizing* negative impacts, playing a role in **shaping external systems** is increasingly seen as both a central social responsibility and an important means for stewarding long-term shareholder value. Take, for example, General Electric (GE), a \$163 billion manufacturer of industrial and consumer products with 300,000 employees and operations in over 100 countries, a company that believes it is facing the greatest breadth of issues of any company in the world.¹³² Although the company has set aggressive targets to reduce greenhouse gas emissions to 1 percent below 2004 levels by 2012, and to cut the emission intensity rate of its operations 30 percent by 2008,¹³³ it is also actively engaged in external efforts to support policy dialogue, generate shared opportunities across industries and with competitors, and encourage climate-friendly lifestyles among individuals.

GE is proactively **advancing dialogue on policy**. The company has publicly stated its support for strong political action on climate change, calling on governments and other organizations to collaborate and demonstrate leadership.¹³⁴ It is proactively working to further science-based, equity-oriented policy frameworks by co-founding the U.S. Climate Action Partnership, which is calling on the federal government to quickly enact strong national legislation requiring significant reductions of greenhouse gas emissions, and in addition by acting as a member of the U.S. Climate Policy Forum and Business Roundtable Climate Resolve. GE is building global pathways for shared understanding and action by working with Combat Climate Change (CCC), a group seeking to influence the post-Kyoto global framework, and the International Climate Change Partnership (ICCP), a coalition committed to constructive and responsible participation in the international policy process surrounding global climate change.

The company is **co-creating opportunities with other organizations**. Through its recent alliance with AES, GE has pledged to become a major purchaser of carbon offsets and in turn to elevate the profile of environmental finance and the need for market-based standards.¹³⁵ The company is building information networks as part of the Pew Center for Global Climate Change's Business Environment Leadership Council (BELC), the largest U.S.-based association of corporations focused on addressing climate challenges. GE is developing operational partnerships, including its work with World Resources Institute (WRI) on projects to explore Carbon Capture and sequestration technologies.¹³⁶

Finally, GE is **encouraging climate-friendly behavior among individuals**, although its efforts in this category are currently somewhat limited. GE's new My Earth Rewards credit card is facilitating discussion and potentially inspiring lower impact consumer choices. GE products such as CFL light bulbs, which provide high efficiency at low relative prices, help to close the "value-action" gap.

The GE example demonstrates three approaches to shaping external systems:

A. Advancing Dialogue on Policy

B. Co-Creating Opportunities with Other Organizations

C. Encouraging Climate-Friendly Behavior Among Individuals

A. Advancing Dialogue on Policy

There is no longer a monolith of obstructionists among corporations. More and more companies **proactively support policies that favor fair and logical climate change regulation, including the development of standards, national legislation and global pathways.** For some firms, such policy advocacy themes are familiar; for companies like ConocoPhillips and other USCAP companies that previously supported only market-based approaches rewarding voluntary action, this trend represents a historic breaking of ranks.

i) Stating the Company's Support for Collaborative Solutions Publicly

including acknowledging the seriousness of climate change,
the company's responsibilities and its position

- In 1997 [BP](#) became the first major oil company to publicly state that precautionary action on global warming is justified.
- [Swiss Re](#) is a signatory to the Statement of the G8 Climate Change Roundtable, a body convened by the World Economic Forum and backed by the heads of 22 other companies to appeal for firm global emissions regulations.¹³⁷
- [Cinergy](#) (now Duke Energy) strongly advocates regulations that will price carbon because it believes such control is inevitable and thus it makes sense to transition now to reduce “stroke-of-the-pen risk” – the risk that policymakers could sign carbon pricing into law and cancel the value of assets overnight.¹³⁸
- [Bank of America](#) states publicly that climate change threatens the ultimate stability and sustainability of our way of life and that the company actively supports Smart Growth regional planning.¹³⁹
- [Ford](#) says, “It is in the interest of society and business to reduce the uncertainty and increase the predictability of policy frameworks and market conditions around the issue of climate change.”¹⁴⁰

ii) Furthering Science-Based, Equity-Oriented Policy Frameworks such as debating, setting agendas and engaging policymakers directly

- [Duke Energy](#) is a founding member of the U.S. Climate Action Partnership (USCAP). The company appeals for a strong but simplified regulatory structure that gives economic signals addressing all emissions.
- [ConocoPhillips](#), also a member of USCAP and the Pew Center Business Environment Leadership Council (BELC), has broken with its industry peers to call for advanced regulation to reduce GHG emissions in the United States.
- [PG&E](#), a charter member of the California Climate Action Registry, has proposed to the California Public Utilities Commission a “Climate Protection Program and Tariff” to allow customers to pay a percentage to make their use carbon neutral.¹⁴¹

iii) Building Global Pathways by facilitating international discussion and collaborative solutions

- [BSkyB](#), as a partner of Combat Climate Change (3C), appeals for integrating climate issues into the markets and trade with facilitation by a global framework.¹⁴²
- [Ericsson](#), which argues that it is important not to lock developing countries into unsustainable solutions,¹⁴³ is a signatory of the UN Global Compact Business Leadership Platform, which aims to increase global dialogue around systems-oriented climate change solutions.
- [Tata Power](#) is a signatory of Earth Institute’s Global Roundtable on Climate Change, an effort aimed to build consensus, explore solutions, champion successful initiatives, provide discussion forums, and catalyze new movements based on a global framework.¹⁴⁴
- [ABN AMRO](#) contributes to the Corporate Leaders Group on Climate Change — part of The Prince of Wales’s Business and the Environment Program (BEP) — a collective business initiative to think about, challenge and debate issues of corporate sustainability.¹⁴⁵
- [United Technologies](#) is a member of the International Climate Change Partnership, a coalition of companies and organizations working to set global policy agendas while maintaining a moderate stance.

Summarizing the Benefits

In advancing dialogue on policy, companies are becoming engaged on multiple levels. These include appropriations and budget politics, executive branch and policy-making issues, law courts and regulatory bodies, and collaboration-based political input on state, national or supra-national levels.¹⁴⁶ Benefits include:

- + **More access to policy-making** that benefits shareholders, such as leveling the playing field to improve anticipated returns from long-term investments, including avoiding “lock-in” to outmoded technologies
- + **Better relationships** with customers and citizens who expect corporations, which have traditionally lobbied for narrow organizational interests, to use their influence for collaborative solution-building
- + **Resolving uncertainty** surrounding future policies, that, unlike risk, cannot be clearly anticipated or planned for and thus hinder commitments; moreover, familiarizing the company with those impending regulations
- + **License to operate** among regulators, particularly for energy-intensive industries affected by public utility commissions and permit-issuing government bodies

B. Co-Creating Opportunities with Organizations

Recognizing that emissions are extremely fragmented geographically and among businesses, companies are employing their financial, informational, relational, technological, human, product and other capabilities to partner with other organizations in order to develop shared mindsets, synergies and positive network effects.

i) Advancing Market-Based Initiatives

including voluntary standards and generally accepted environmental finance practices

- [Xstrata](#), an Australian mining company, is participating in the Greenhouse Challenge Plus, a voluntary program between industry and the Australian national government.¹⁴⁷
- [Interface](#), which launched the carbon-neutral “Cool Carpet” in 2003, has its Director of Sustainable Development on the steering committee of the Voluntary Carbon Standard.¹⁴⁸
- [Morgan Stanley](#), in recently partnering with Det Norske Veritas (DNV) to launch a Carbon Bank, is supporting the expansion of the carbon market, which will help to drive a badly needed convergence of standards.¹⁴⁹
- [Sony](#) is a member of the Chicago Climate Exchange (CCX), the world’s first and North America’s only legally binding rules-based GHG emissions allowance trading system and the world’s only global system for emissions trading based on all six greenhouse gases.
- [Eastman Kodak Company](#) is a member of the California Climate Registry (CCAR), which helps establish GHG emissions baselines against which many future GHG emission reduction requirements may be applied.
- [Gap Inc.](#), as a member of the San Francisco-based Business Council on Climate Change, supports the wider adoption of pledges for voluntary emissions reduction and corporate culture commitments.

ii) Building Informational Networks

such as disseminating knowledge

- [Recreational Equipment Inc.](#) (REI) is working with regional partners to share best practices as part of the Seattle Climate Partnership and San Francisco Business Council on Climate Change.
- [Vodafone](#) has commissioned the Earth Calling report, a study informing the public of the environmental impacts of the mobile telecommunications industry.¹⁵⁰
- [HSBC](#) has developed the Climate Confidence Index that aims to gauge and make available to the public trends in attitudes about climate change.¹⁵¹

- [Alcan](#) has developed EHS First, an approach to translating its commitment to the environment, health and safety into measurable actions; between 1990 and 2005 the company reduced its emissions of greenhouse gases 25 percent, committing itself to a further 10 percent reduction by 2010.¹⁵²
- [Intel](#) has shared best practices with other companies at the working group “Arriving at Strategic Policy Positions on Climate Change,” led by BSR.
- [Hyperion](#) has published the guide “How Can You Drive Change?” to share its lessons with other companies on creating employee emissions reductions programs.¹⁵³

iii) Developing Operational Partnerships

including industry and cross-sector partnerships and investments

- [HSBC](#) has developed the \$100 million Climate Partnership, a five-year alliance between The Climate Group, Earthwatch Institute, Smithsonian Tropical Research Institute and WWF, which aims to create cleaner, greener major cities, enable “climate champions,” conduct the largest-ever field experiment on the long-term effects of climate change, and protect the world’s major river systems.¹⁵⁴
- [Wells Fargo](#), a dedicated purchaser of clean energy, provides capital to renewable energy projects, in which it currently has invested over \$1 billion.
- [Climate Change Capital](#), an investment banking group, advised on and raised capital for numerous low-carbon projects. These include financing renewable energy installations in the United Kingdom; destroying industrial gases in India and China; advice on the acquisition and divestiture strategy for Private Equity funds and carbon-intensive industries in Europe; and waste-to-energy projects in China and Hungary.¹⁵⁵
- [Google](#) is using its technologies such as Google Earth and Google Maps to help other organizations augment their ability to understand and solve climate challenges.¹⁵⁶

Summarizing the Benefits

Companies are co-creating value with other organizations for various reasons, including developing market strategies to differentiate themselves from their rivals and within the non-market environments of special issues, institutions, interests and information.¹⁵⁷ Whether companies choose partners based on similar strengths and objectives to create scale, or seek complementary traits for creating synergies, there are common potential benefits:

+ **Developing specialized technical** expertise to enhance productive capacity or reduce uncertainty around specific business opportunities

+ **Gaining legitimacy** by working with issue experts and/or nonprofit objective voices

+ **Learning by gaining awareness** around social forces and accessing distinct networks

+ **Acquiring competitive advantages** resulting from experience with new types of projects, markets and locations

C. Encouraging Climate-Friendly Behavior Among Individuals

Given the growing realization that successfully abating climate change will require changing behaviors, some companies are using their strengths to **encourage climate-friendly behavior** among individuals.

i) Facilitating Dialogue

including providing real and virtual venues and leading discussions

- [Yahoo!](#)'s Green web portal enables customers to meet and engage in dialogue on climate issues.
- [News Corporation](#) has launched the MySpace channel "OurPlanet," which informs users about climate change, suggests tips for action and encourages discussion.
- [evo](#) uses its floor space to host community events such as "Green Drinks" to facilitate discussion on climate change and other sustainability issues.
- [Clif Bar](#), which published its "Moving Toward Sustainability" newsletter five years before "An Inconvenient Truth," brings people together for discussion on global warming through a number of channels, including public education partnerships like the mobile Save Our Snow road trip, in which it visited U.S. ski resorts to raise awareness and discuss climate change issues.
- [Whole Foods](#) is educating customers on Eco-Action tips and helping them to understand ecosystems phenomena like pollination.¹⁵⁸

ii) Enabling Action

such as closing the "value-action" gap in providing choices that are consistent with ongoing commitments and aspirations¹⁵⁹ while simple, convenient and tangibly beneficial

- [B&Q](#), following an online survey receiving 7,000 responses, extended product lines to include home micro-generation technology, and introduced items such as home solar panels and wind turbines in stores and via B&Q's website.
- [We're in this Together](#), a consortium of top household brand names, offers quick and easy actions that the public can do to combat climate change.
- [Keep Winter Cool](#), a snow-sports industry initiative, aims to raise visibility and public understanding of global warming and spotlight opportunities that exist right now to start fixing the problem.
- [New Resource Bank](#) is reducing capital costs for green building on commercial and multi-unit residential sectors.¹⁶⁰

iii) Inspiring Lower-Impact Behaviors by appealing to adopt new actions and lifestyles

- [BSkyB](#), acknowledging that it is in a powerful position to communicate directly with one in three homes across the United Kingdom, is communicating to mainstream customers on its Join the Bigger Picture website.
- [Yahoo!](#) helps customers understand how they can address global warming in their daily actions with Yahoo! Green.
- [Ogilvy and Mather's \[www.fightglobalwarming.com\]\(http://www.fightglobalwarming.com\)](#) website aims to encourage action using a mix of rational and emotional appeals.
- [MTV's](#) Switch campaign seeks to motivate more climate-friendly attitudes among youth.
- [Clif Bar](#), through its Save Our Snow mobile tour, is using ski celebrities to encourage people to carpool and improve other habits.
- [Duke Energy](#) suggests that one of the most important ways companies can inspire people is by helping them understand the broader net benefits associated with more stringent regulation, including greenhouse gas taxes.

Summarizing the Benefits

Although it is traditionally government agencies and NGOs – not private sector companies – that seek to motivate positive social behavioral change, businesses often possess the capabilities, information and relationships that enable them to be significant leaders. Realizing this, companies are starting to employ the principles of social marketing or using commercial marketing to “influence a target audience to voluntarily accept, modify or abandon a behavior for the benefit of individuals, groups or society as a whole”¹⁶¹ related to climate change. Integrating such efforts into existing strategies presents the following opportunities:

+ **Attracting new partners** including suppliers and employees who are interested in companies that foster closer relationships with certain customers, markets and demographics

+ **Ensuring a license to operate** among the public, particularly for global companies that have large potential influence over behavior

+ **Improving collaboration** with governments, that have traditionally addressed social and environmental issues, but are interested in partners to help them drive behavioral changes

+ **Better regulatory positioning** for large companies or those with high-emission products that have significant potential to be used more efficiently

VI. Seven Takeaways

It's not about being carbon neutral – it's about growing the climate movement.

- Elysa Hammond, Environmental Scientist, Clif Bar, 2007

Management makes order. It sets plans, organizes resources, solves problems and produces results. Leadership, in contrast, makes change. It establishes direction, drives strategy, coordinates efforts and motivates. The two are twin opposites, and without the other, each is irrelevant.¹⁶² This could not be truer than in the context of addressing climate change, a social and environmental issue with global causes and consequences, impacts likely to persist, and considerable risks.¹⁶³

It is clear that combining the tactical management of emissions reductions with systems-oriented strategies will be pivotal to creating the most meaningful change. The practices described in this report provide a varied menu of potential options for managers to consider. Few companies excel across the board, and some seen as leaders in one respect are also regarded as laggards in others (e.g. Ford Motor Company).¹⁶⁴ Thus, there is something to be learned from examining the early experiences of companies embracing some of these practices. The following key lessons emerge:

1. **It takes two to emit.** While many companies have started managing physical emissions from sources they can control, leaders have begun managing the supply and demand of emissions associated with the human behavior, technologies, investments and policies that they are able to influence. Companies doing so demonstrate that while direct physical emissions are important, a different skill set is needed for addressing “indirect” emissions, including “embedded emissions” (those occurring upstream in the production of goods and services that the company purchases) and “product use emissions” (those which occur downstream as a result of consumers using the company’s products).
2. **Mixed signals necessitate a portfolio approach.** Companies face pressure to undergo transformational change, yet meanwhile demonstrate practical solutions in the short term. Customers want more information, but complain that there is already too much noise. In order to prevent pressures such as these from becoming paralyzing, companies should develop a portfolio of initiatives that are diversified by types and cycles of time.
3. **The best reporting tells stories.** In communicating progress to stakeholders, quantitative results are important, but qualitative information is critical to provide context. Moreover, in addition to discussing end results, characterizing leadership efforts in terms of their business processes (e.g. efforts toward ensuring strong governance) offers a means to invite dialogue and provide reassurance. Sustainability reports that offer useful models include those compiled by [British Telecom](#), [Shell](#), [Ikea](#), [Verizon](#), [Novo Nordisk](#), [BSkyB](#), [Vodafone](#), [Herman Miller](#) and [Timberland](#).

4. **A consistent and aligned external message is crucial.** Leading companies ensure that the environmental and social message a company communicates is aligned throughout the company, particularly among the public policy, CSR and marketing departments. Companies report that this has been historically challenging due to a lack of clear signals from executives, interdepartmental differences in approach, conflicting reward structures and culture, and a lack of communication due to “silos.” Misalignment between departments has led to inconsistencies in external action that significantly deteriorate customer and investor trust in the company. In this information-intensive age, it is crucial to overcome the aforementioned barriers to ensure a consistent message and alignment across departments.
5. **Cross-sector partners offer key points of leverage.** It has long been acknowledged that engaging in environmental partnerships with NGOs can have benefits. This is particularly true when addressing climate change, a phenomenon bringing about a historic convergence of financial and scientific agendas. There is a plethora of governmental agencies and NGOs helping firms to develop robust, credible and generally cost-effective climate change strategies.
6. **Sometimes leadership calls for being part of a pack.** In addition to creating new one-on-one partnerships, companies are also forming large collective groups to learn, discuss, debate and lobby. Early lessons show there is often a case for this if the industry is a target of regulation and other industries are not, if stakeholders regard all companies as equally culpable, and if there are potential revenue benefits and the ability to share costs. Individual action is often more warranted, on the other hand, if the company has the opportunity for breaking new ground, if the company is a target, or if collaboration would be difficult, costly and/or slow.
7. **Climate exists within a broader sustainability context.** Most importantly, climate imperatives should always be consistent with a broader agenda for corporate sustainability. When developing approaches to climate change, managers must look at entire systems in order to avoid unexpected negative consequences elsewhere – in other words, creating costlier problems than the ones they set out to fix. For example, there is currently much fervor around first-generation biofuels touted as climate solutions, but the negative environmental and social impacts that come with them could make them a “fix that fails.” So managers should consider their response to climate change as an opportunity to invest in management systems for sustainability issues more broadly. Water footprinting and product labeling for toxics, for example, are becoming critical issues that companies versed in climate leadership will be prepared to understand and capitalize on.

The end goal of business climate leadership is to reduce the emissions intensity of society while adapting to the climate change we are already experiencing. This requires business leaders to recognize the larger subsurface structures that perpetuate emissions, and to build new mental models for investing in – and communicating – initiatives that maximize the potential for performance over time, use influence to improve significant indirect impacts, and contribute capabilities and relationships to solve problems as entrepreneurs.

As always, taking the lead into uncharted territories raises more questions than it answers, at least in the short-term. Yet, despite these uncertainties, one thing *is* clear: This is a time of need for visionary and bold leadership to drive collaborative, evolving solutions. Given the findings in this report, we conclude that much of this leadership can originate in the private sector, and that the companies at the forefront will find rewards.

VII. References

- ¹ BSR (2007) "Who's Going Carbon Neutral?" Business for Social Responsibility. Available at http://www.bsr.org/reports/BSR_Carbon-Neutral-Chart.pdf.
- ² BSR (2007) "Who's Going Carbon Neutral?" Business for Social Responsibility. Available at http://www.bsr.org/reports/BSR_Carbon-Neutral-Chart.pdf.
- ³ The Climate Group (2007) "In the Black: The Growth of the Low Carbon Economy."
- ⁴ Waage, Sissel and Stewart, Emma (2006) "A Three-Pronged Approach to Corporate Climate Strategy." Available at http://www.bsr.org/reports/BSR_Carbon-Neutral-Chart.pdf.
- ⁵ The Climate Group (2007) "Carbon Down, Profits Up." Available at http://www.theclimategroup.org/assets/Carbon_Down_Profit_Up.pdf.
- ⁶ Strom, Stephanie (2007) "Businesses Try to Make Money and Save the World," *The New York Times*, May 6
- ⁷ Austin, James E. (2007) "Capitalizing on Convergence," *Stanford Social Innovation Review*. Available at http://www.ssireview.org/articles/entry/capitalizing_on_convergence.
- ⁸ Referenced from <http://cnbceb.com/2007/05/01/top-50-lowcarbon-pioneers>.
- ⁹ *BusinessWeek* (2005) "Top [Climate] Companies of the Decade," http://www.businessweek.com/magazine/content/05_50/b3963415.htm.
- ¹⁰ Gunther, Mark (2007) "10 Green Giants," *Fortune*, http://money.cnn.com/galleries/2007/fortune/0703/gallery.green_giants.fortune/index.html.
- ¹¹ Smith, Jeffrey and Morreale, Matthew (2007) "Boardroom Climate Change." *New York Law Journal*. Available at <http://www.law.com/jsp/ihc/PubArticleIHC.jsp?id=1185181600213>.
- ¹² Referenced from http://theclimategroup.org/index.php/reducing_emissions/case_study/swiss_re.
- ¹³ Referenced from internal BSR research.
- ¹⁴ CSRwire (2007) "New Study on Carbon Risk." August 6, Available at <http://www.csrwire.com/News/9364.html>.
- ¹⁵ Downing, Phil and Ballantyne, Joe (2007) "Tipping Point or Turning Point? Social Marketing and Climate Change." Ipsos Mori. Available at <http://www.ipsos-mori.com/publications/srreports/climatechange.shtml>.
- ¹⁶ Enkvist, Per Anders, et al. (2007) "Cost Curve for Greenhouse Gas Reduction" The McKinsey Quarterly. No. 1. Available at <http://www.mckinseyquarterly.com/PDFDownload.aspx?L2=3&L3=0&car=1911>.
- ¹⁷ Enkvist, Per Anders, et al. (2007) "Cost Curve for Greenhouse Gas Reduction" The McKinsey Quarterly. No. 1. Available at <http://www.mckinseyquarterly.com/PDFDownload.aspx?L2=3&L3=0&car=1911>.
- ¹⁸ Esty, Daniel C. and Winston, Andrew S. (2006) *Green to Gold*. Yale University Press: New Haven. p. 108.
- ¹⁹ *ibid* at 210
- ²⁰ Varchaver, Nicholas (2007) "The Ozone Lesson," *Fortune*. March 22. Available at http://money.cnn.com/magazines/fortune/fortune_archive/2007/04/02/8403424/index2.htm.
- ²¹ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ²² Referenced from http://vocuspr.vocus.com/VocusPR30/Newsroom/Query.aspx?SiteName=DupontNew&Entity=PRAsset&SF_PRAAsset_PRAAssetID_EQ=104612&XSL=PressRelease&Cache=False.
- ²³ Referenced from http://vocuspr.vocus.com/VocusPR30/Newsroom/Query.aspx?SiteName=DupontNew&Entity=PRAsset&SF_PRAAsset_PRAAssetID_EQ=104612&XSL=PressRelease&Cache=False.
- ²⁴ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ²⁵ Referenced from http://theclimategroup.org/index.php/reducing_emissions/case_study/dupont.
- ²⁶ Referenced from http://theclimategroup.org/index.php/reducing_emissions/case_study/dupont.
- ²⁷ Referenced from <http://www.safetycouncil.com/pdf/649Martin.pdf>.
- ²⁸ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ²⁹ Holmes, Stanley (2006) "Nike Goes for the Green." *BusinessWeek*, September 25. Available at http://www.businessweek.com/magazine/content/06_39/b4002108.htm?chan=innovation_branding_top+stories.
- ³⁰ Referenced from <http://www.greenpeace.org/usa/news/ask-and-ye-shall-receive/companies-try-keeping-ice-crea>.
- ³¹ Referenced from <http://www.environmentaldefense.org/article.cfm?ContentID=5778>.
- ³² Referenced from http://www.abbott.com/global/url/pressRelease/en_US/60.5.5/Press_Release_0419.htm.
- ³³ Sustainable Silicon Valley (2006) "CO₂ Report 2006." Available at http://sustainablesiliconvalley.org/docs/2006_SSV_CO2_Report.pdf.
- ³⁴ Vodafone (2007) "Corporate Responsibility Report for the 2006 Financial Year." Available at http://www.vodafone.com/etc/medialib/attachments/cr_downloads.Par.85926.File.dat/vodafone_cr_final_interactive.pdf.
- ³⁵ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ³⁶ Referenced from <http://www.environmentaldefense.org/article.cfm?ContentID=5778>.
- ³⁷ Referenced from <http://www.epa.gov/greenpower/partners/partners/pepsico.htm>.
- ³⁸ Referenced from http://www.marksandspencer.com/gp/browse.html/ref=sc_fe_c_1_50890031/026-1418218-7639601?ie=UTF8&node=51444031&no=50890031&mnSBrand=core&me=A2BO0YVBKIQJM.
- ³⁹ Referenced from <http://www.racetothetop.org/case/case4.htm>.
- ⁴⁰ Referenced from http://www.newscorp.com/energy/full_speech.html.

-
- ⁴¹ Referenced from <http://googleblog.blogspot.com/2006/10/corporate-solar-is-coming.html>.
- ⁴² Referenced from <http://www.epa.gov/cppd/awards/2007/winners.html#cgma>.
- ⁴³ Referenced from <http://www.johnsoncontrols.com/publish/us/en.html>.
- ⁴⁴ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ⁴⁵ Sustainable Silicon Valley (2006) "CO₂ Report 2006." Available at http://sustainablesiliconvalley.org/docs/2006_SSV_CO2_Report.pdf.
- ⁴⁶ Makower, Joel, et al. (2007) "Clean Energy Trends 2007." Available at <http://www.cleandedge.com/reports/Trends2007.pdf>.
- ⁴⁷ Referenced from http://www.bitc.org.uk/news_media/climate_change_pub.html.
- ⁴⁸ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ⁴⁹ Ford (2005) "Ford Report on the Business Impact of Climate Change." Available at <http://www.ford.com/NR/rdonlyres/e6vzmdwyz2ycyehpwwuj5sdkrmfknipsreoyznmwwfqtzlwqfbcq44ckquxgn5xfir532knjvkq3ovbyhuscz7sfb/fordReportBusImpClimChg.pdf>.
- ⁵⁰ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ⁵¹ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ⁵² Esty, Daniel C. and Winston, Andrew S. (2006) *Green to Gold*. Yale University Press: New Haven. Pp. 244-5
- ⁵³ Referenced from http://www.bitc.org.uk/resources/case_studies/afe_1401_serco.html.
- ⁵⁴ Referenced from http://www.bitc.org.uk/resources/case_studies/dla_piper_sustain.html.
- ⁵⁵ The Climate Group (2007) "In the Black: The Growth of the Low Carbon Economy." Available at http://www.bizsandiego.com/index.php?option=com_content&task=view&id=196&Itemid=2.
- ⁵⁶ Referenced from http://www.bitc.org.uk/resources/case_studies/afe1493_prospiero.html.
- ⁵⁷ Sustainable Silicon Valley (2006) "CO₂ Report 2006." Available at http://sustainablesiliconvalley.org/docs/2006_SSV_CO2_Report.pdf.
- ⁵⁸ Referenced from <http://sustainablesiliconvalley.org/docs/Employer%20percs%20for%20CO2%20reductions.pdf>.
- ⁵⁹ Sustainable Silicon Valley (2006) "CO₂ Report 2006." Available at http://sustainablesiliconvalley.org/docs/2006_SSV_CO2_Report.pdf.
- ⁶⁰ Esty, Daniel C. and Winston, Andrew S. (2006) *Green to Gold*. Yale University Press: New Haven. P. 207
- ⁶¹ ibid at 215-6
- ⁶² ibid at 106-7
- ⁶³ Referenced from http://www.shell.com/home/content/envirosoc-en/environment/climate_change/managing_greenhouse_gas_emissions_from_our_operations/energy_efficiency_03052007.html.
- ⁶⁴ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ⁶⁵ Hoffman, Andrew (2006) "Getting Ahead of the Curve: Corporate Strategies That Address Climate Change." Available at <http://www.pewclimate.org/docUploads/Alcoa%20case%20study.pdf>.
- ⁶⁶ Referenced from <http://www.confactionerynews.com/news/ng.asp?id=77863-cadbury-emissions-green>.
- ⁶⁷ Referenced from http://www.bitc.org.uk/resources/case_studies/camelor_group_plc.html.
- ⁶⁸ Referenced from http://energypriorities.com/entries/2005/11/hybrid_bonus.php.
- ⁶⁹ Referenced from <http://sustainablesiliconvalley.org/docs/Employer%20percs%20for%20CO2%20reductions.pdf>.
- ⁷⁰ Referenced from http://energypriorities.com/entries/2005/11/hybrid_bonus.php.
- ⁷¹ Referenced from <http://www.grist.org/news/muck/2006/07/19/gore-walmart>.
- ⁷² Referenced from http://www.climateinstitute.org.au/cia1/a_business.html.
- ⁷³ Referenced from <http://www.walmartfacts.com/articles/4784.aspx>.
- ⁷⁴ Dixon, Frank (2006) "Sustainability and Systems Change: Wal-Mart's Pioneering Strategy," CSRwire. April 18. Available at http://www.csrwire.com/pdf/WMT_Sustainability_4-06.pdf.
- ⁷⁵ Referenced from <http://www.walmartstores.com/GlobalWMTStoresWeb/navigate.do?catg=349>.
- ⁷⁶ Mesure, Susie (2007) "Wal-Mart in pledge to slash its carbon footprint," *The Independent*. February 2, Available at http://findarticles.com/p/articles/mi_qn4158/is_20070202/ai_n17205813.
- ⁷⁷ Referenced from http://theclimategroup.org/reducing_emissions/case_study/wal_mart.
- ⁷⁸ Referenced from <http://www.switched.com/2007/07/19/300-earth-friendly-pc-being-sold-at-wal-mart>.
- ⁷⁹ The Climate Group (2007) "In the Black: The Growth of the Low Carbon Economy." Available at http://www.bizsandiego.com/index.php?option=com_content&task=view&id=196&Itemid=2.
- ⁸⁰ Referenced from http://theclimategroup.org/reducing_emissions/case_study/wal_mart/.
- ⁸¹ Referenced from <http://www.walmartfacts.com/articles/4785.aspx>.
- ⁸² Referenced from <http://www.walmartfacts.com/articles/4960.aspx>.
- ⁸³ Referenced from <http://www.walmartfacts.com/articles/4960.aspx>.
- ⁸⁴ Cavinato, Joseph (2006) Presentation: "Supply Chain Leadership," *Thunderbird School of Global Management*.
- ⁸⁵ Carbon Trust (2006) "Carbon Footprints in the Supply Chain: The Next Step for Business." Available at <http://www.carbontrust.co.uk/publications/publicationdetail?productid=CTC616>.
- ⁸⁶ Esty, Daniel C. and Winston, Andrew S. (2006) *Green to Gold*. Yale University Press: New Haven. Pp. 203-4
- ⁸⁷ Referenced from <http://www.environmentaldefense.org/article.cfm?ContentID=5778>.
- ⁸⁸ Referenced from <http://www.unilever.com/ourvalues/environment-society/sus-dev-report/climate-change>.
- ⁸⁹ <http://www.worldwildlife.org/climate/projects/climatesavers/companies.cfm>.
- ⁹⁰ Referenced from http://www.bitc.org.uk/resources/case_studies/afe1252_bskyb.html.

- ⁹¹ Referenced from http://www.timberland.com/include/csr_reports/2006_TBL_CSR_Report_Full.pdf.
- ⁹² Referenced from http://www.marksandspencer.com/gp/browse.html/ref=sc_fe_c_1_50890031/026-1418218-7639601?ie=UTF8&node=51444031&no=50890031&mnSBrand=core&me=A2BO0YVBKIQJM.
- ⁹³ Referenced from <http://www.upslogisticstech.com/pages/products/rn>.
- ⁹⁴ Referenced from http://www.nike.com/nikebiz/nikeresponsibility/pdfs/color/Nike_FY05_06_CR_Report_C.pdf.
- ⁹⁵ Jin, Byoung-ho (2004) "Achieving an Optimal Global Versus Domestic Sourcing Balance Under Demand Uncertainty," *International Journal of Operations & Production Management*. Available at <http://www.emeraldinsight.com/Insight/viewContentItem.do;jsessionid=5487DA97F14E67BCD91C213F177F9B36?contentType=Article&hdAction=lnkhtml&contentId=849579>.
- ⁹⁶ Referenced from <http://www.foodinternational.net/articles/food-buying/484/value-sourcing-%96-buy-cheaper-better-faster-.html>.
- ⁹⁷ Referenced from <http://www.racetothetop.org/case/case4.htm>.
- ⁹⁸ Carbon Disclosure Project (2006) "CDP4." Available at <http://www.cdproject.net/cdp4reports.asp>.
- ⁹⁹ Carbon Trust (2006) "The Carbon Emissions Generated in All That We Consume." Available at <http://www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=CTC603>.
- ¹⁰⁰ Carbon Trust (2006) "Carbon Footprints in the Supply Chain: The Next Step for Business." Available at <http://www.carbontrust.co.uk/publications/publicationdetail?productid=CTC616>.
- ¹⁰¹ <http://supplychainnetwork.com/?p=36>.
- ¹⁰² Esty, Daniel C. and Winston, Andrew S. (2006) *Green to Gold*. Yale University Press: New Haven. P. 197
- ¹⁰³ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ¹⁰⁴ Referenced from <http://www.imaging-resource.com/NEWS/1170956581.html>.
- ¹⁰⁵ Referenced from <http://puregreencars.com/Green-Cars-News/Ethanol/Toyota-Introduce-Ethanol-Cars-in-Brazil.html>.
- ¹⁰⁶ Referenced from http://www.bitc.org.uk/news_media/climate_change_pub.html.
- ¹⁰⁷ Referenced from <http://www.unilever.com/ourvalues/environment-society/sus-dev-report/climate-change>.
- ¹⁰⁸ Referenced from <http://www.steelcase.com/na/products.aspx?f=11845&c=17820>.
- ¹⁰⁹ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ¹¹⁰ Referenced from http://www.bitc.org.uk/resources/case_studies/afe1252_bskyb.html.
- ¹¹¹ Referenced from <http://www.personal.barclays.co.uk/BRC1/jsp/brcontrol?task=articleFWsocial&value=12564&target=self&site=pfs>.
- ¹¹² Referenced from <http://www.dnnews.com/cms/lib/8362.pdf>.
- ¹¹³ Referenced from <http://bdcnetwork.com/article/CA6413831.html>.
- ¹¹⁴ Referenced from <http://www.upslogisticstech.com/pages/realstories/byproduct/real-stories.aspx?productid=1>.
- ¹¹⁵ Referenced from http://www.bitc.org.uk/resources/case_studies/afe_env_04_liftshare.html.
- ¹¹⁶ Referenced from http://www.bitc.org.uk/what_we_do/may_day/why_take_action.html.
- ¹¹⁷ Accountability (2007) "What Assures Consumers on Climate Change?" Available at www.accountability21.net/uploadedFiles/publications/What%20Assures%20Consumers%20on%20Climate%20Change.pdf.
- ¹¹⁸ Accountability (2007) "What Assures Consumers on Climate Change?" Available at www.accountability21.net/uploadedFiles/publications/What%20Assures%20Consumers%20on%20Climate%20Change.pdf.
- ¹¹⁹ Timberland (2007) "2006 Corporate Social Responsibility Report." Available at http://www.timberland.com/include/csr_reports/2006_TBL_CSR_Report_Full.pdf.
- ¹²⁰ Referenced from http://www.marksandspencer.com/gp/browse.html/ref=sc_fe_c_6_0_51444031_1/026-1418218-7639601?ie=UTF8&node=54209031&no=51444031&mnSBrand=core&me=A2BO0YVBKIQJM.
- ¹²¹ Accountability (2007) "What Assures Consumers on Climate Change?" Available at www.accountability21.net/uploadedFiles/publications/What%20Assures%20Consumers%20on%20Climate%20Change.pdf.
- ¹²² Referenced from <http://www.unilever.com/ourvalues/environment-society/sus-dev-report/climate-change/default.asp>.
- ¹²³ Referenced from http://www.bitc.org.uk/news_media/climate_change_pub.html.
- ¹²⁴ Referenced from http://www.pge.com/customer_service/ami.
- ¹²⁵ Referenced from <http://www.saveasyoudrive.com>.
- ¹²⁶ Referenced from http://www.shell.com/home/content/envirosoc-en/environment/climate_change/helping_customers_reduce_emissions/000407.html.
- ¹²⁷ Accountability (2007) "What Assures Consumers on Climate Change?" Available at www.accountability21.net/uploadedFiles/publications/What%20Assures%20Consumers%20on%20Climate%20Change.pdf.
- ¹²⁸ Referenced from http://theclimategroup.org/index.php/reducing_emissions/case_study/swiss_re.
- ¹²⁹ Referenced from <http://www.unilever.com/ourvalues/environment-society/sus-dev-report/climate-change>.
- ¹³⁰ Accountability (2007) "What Assures Consumers on Climate Change?" Available at www.accountability21.net/uploadedFiles/publications/What%20Assures%20Consumers%20on%20Climate%20Change.pdf.
- ¹³¹ Referenced from <http://www.cbsnews.com/stories/2007/01/23/business/main2387501.shtml>.
- ¹³² Referenced from <http://www.ge.com/company/citizenship/public/index.html>.
- ¹³³ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ¹³⁴ Referenced from http://www.ge.com/company/worldwide_activities/climate_action.html.
- ¹³⁵ Deutsch, Claudia (2007) "G.E. Unveils Credit Card Aimed at Relieving Carbon Footprints," *The New York Times*. July 25. Available at <http://www.nytimes.com/2007/07/25/business/25card.html?ex=1343188800&en=1e431528bc614ad7&ei=5124&partner=permalink&expprod=permalink>.

-
- ¹³⁶ Referenced from <http://www.wri.org/climate/partners.cfm>.
- ¹³⁷ World Economic Forum (2005) "Statement of the G8 Climate Roundtable." Available at http://www.weforum.org/pdf/g8_climatechange.pdf.
- ¹³⁸ Referenced from http://www.caseplace.org/cases/cases_show.htm?doc_id=433434.
- ¹³⁹ Referenced from http://www.bankofamerica.com/environment/index.cfm?template=env_clickchangeapos.
- ¹⁴⁰ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.
- ¹⁴¹ Sustainable Silicon Valley (2006) "CO₂ Report 2006." Available at http://sustainablesiliconvalley.org/docs/2006_SSV_CO2_Report.pdf.
- ¹⁴² Referenced from <http://www.combatclimatechange.org>.
- ¹⁴³ Referenced from http://www.ericsson.com/ericsson/corporate_responsibility/cr06/technology/climatechange.shtml.
- ¹⁴⁴ Referenced from <http://www.earthinstitute.columbia.edu/grocc/about.html>.
- ¹⁴⁵ Referenced from http://www.cpi.cam.ac.uk/programmes/sustainable_development/business_the_environment_pro/about_bep/who_we_are/external_contributors.aspx.
- ¹⁴⁶ Isham, Jonathan and Waage, Sissel (2007) "Ignition: What You Can Do to Fight Global Warming and Spark a Movement." Washington, DC: Island Press.
- ¹⁴⁷ Referenced from <http://www.greenhouse.gov.au/challenge>.
- ¹⁴⁸ Referenced from <http://www.icta.org/icta/www/pages/getfile.php?docID=2501>.
- ¹⁴⁹ Referenced from http://www.greenbiz.com/news/news_third.cfm?NewsID=35728.
- ¹⁵⁰ Forum for the Future (2006) "Earth Calling: The Environmental Impacts of the Mobile Telecommunications Industry." Available at http://www.vodafone.com/etc/medialib/attachments/cr_downloads.Par.55666.File.dat/earthcalling_Final.pdf.
- ¹⁵¹ Referenced from http://www.hsbc.com/1/PA_1_1_S5/content/assets/newsroom/hsbc_ccindex_p8.pdf.
- ¹⁵² Referenced from http://www.ehsfirst.com/en/ehs_first_edge.html.
- ¹⁵³ Referenced from <http://www.hyperion.com/driveclean/bestpractices.pdf>.
- ¹⁵⁴ Referenced from <http://www.earthwatch.org/site/pp.asp?c=crLQK3PHLsF&b=2770953>.
- ¹⁵⁵ Referenced from http://www.bitc.org.uk/resources/case_studies/ccc.html.
- ¹⁵⁶ Referenced from <http://www.google.com/corporate/green/energy/aware1.html>.
- ¹⁵⁷ Baron, David P. (1995) "The Nonmarket Strategy System." Sloan Management Review.
- ¹⁵⁸ http://www.newchapter.info/media/press_releases/whole_foods.html.
- ¹⁵⁹ AccountAbility and Consumers International (2007) "What Assures Consumers on Climate Change?" June. Available at http://www.consumersinternational.org/shared_asp_files/GFSR.asp?NodeID=96683.
- ¹⁶⁰ Referenced from <http://bcdnetwork.com/article/CA6413831.html>.
- ¹⁶¹ Kotler, Philip, Roberto, Ned & Lee, Nancy (2002) *Social Marketing, Improving the Quality of Life*. SAGE Publications: California.
- ¹⁶² Siehl, Caren (2007) Presentation: "Leadership Effectiveness Framework," *Thunderbird School of Global Management*.
- ¹⁶³ Referenced from <http://www.cs.bc.edu/~muller/teaching/cs021/lib/ClimateChange.pdf#>.
- ¹⁶⁴ Ceres (2006) "2006 Corporate Governance and Climate Change: Making the Connection." Available at http://www.ceres.org/pub/docs/Ceres_corp_gov_and_climate_change_0306.pdf.